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ABSTRACT

This study explored the personality correlates of substance use by administering a questionnaire consisting of the Mini Markers Scale and items assessing substance abuse to 108 high school students and 155 college students. The Mini Markers Scale is a 40 item self-report inventory that measures basic dimensions of personality, including neuroticism, extraversion, intellectance, agreeableness, and conscientiousness. Correlational analyses of the data from the entire sample revealed a relationship between extraversion and alcohol use, intellectance and alcohol use, and conscientiousness and cigarette use. No significant relationships between personality and marijuana use were noted. Use of alcohol, cigarettes, and marijuana were all significantly intercorrelated. In order to assess differences across developmental period, responses from the high school students and college students were analyzed separately. For the high school sample, agreeableness was significantly negatively correlated with alcohol, marijuana, and cigarette use. Conscientousness and alcohol use were also significantly correlated. For the college sample, there was a significant relationship between intellectance and marijuana use. A strong association between alcohol and marijuana use and an association between alcohol and extraversion were found. There was no significant relationship between cigarette use and any of the personality factors within the college sample. (Contains 40 references.) (GCP)

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The relationship between personality and self-reported substance use:

Exploring the implications for high school and college educational programs

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2003

Abstract

This study explored the personality correlates of substance use by administering a questionnaire consisting of the Mini Markers Scale and items assessing substance abuse to 108 high school students (43 males, 65 females) and 155 college students (85 males, 70 females). The Mini Markers Scale (Saucier, 1992) is a 40 item self-report inventory that measures basic dimensions of personality, including neuroticism (the general tendency to experience negative affect), extraversion (tendency to be sociable, assertive, active, and talkative), intellectance (tendency to display active imagination, aesthetic sensitivity, intellectual curiosity, and independent judgment), agreeableness (tendency to be altruistic, sympathetic, and eager to help others), and conscientiousness (tendency to be organized, strong-willed, and purposeful).

Directionally adjusted items were totaled to create summary scores for extraversion, neuroticism, agreeableness, conscientiousness, and intellectance. Correlational analyses of the data from the entire sample revealed a relationship between extraversion and alcohol use ($r = .14$, $p < .05$), intellectance and alcohol use ($r = -.18$, $p < .01$), and conscientiousness and cigarette use ($r = -.12$, $p < .05$). No significant relationships between personality and marijuana use were noted. Use of alcohol, cigarettes, and marijuana were all significantly intercorrelated (r range: .36 to .59; $p < .001$).

In order to assess differences across developmental period, responses from the high school students and college students were analyzed separately. Although marijuana use was not differentially associated with personality factors for the sample considered in its entirety, significant correlates emerged when the high school and college samples were investigated separately. For the high school sample, agreeableness was significantly negatively correlated with alcohol, marijuana, and cigarette use (alcohol, $r = -.28$, $p < .01$; marijuana, $r = -.21$, $p < .05$; cigarettes, $r = -.32$, $p < .001$). Conscientiousness and alcohol use were also significantly correlated ($r = -.20$, $p < .05$). For the college sample, there was a significant relationship between intellectance and marijuana use ($r = .24$, $p < .01$). A strong association between alcohol and marijuana use ($r = .38$, $p < .001$) and an association between alcohol and extraversion ($r = .22$, $p < .05$) were found. There was no significant relationship between cigarette use and any of the personality factors within the college sample.

Introduction

Decades ago, Eysenck (1967) reported that basic dimensions of personality mediated a variety of behaviors, including reactions to various psychoactive substances. While introverts were expected to be more sensitive to stimulants (coffee tends to make them anxious, while alcohol has little effect), extraverts were expected to be more sensitive to depressants (coffee has little effect, while alcohol intoxicates relatively quickly).

The personality variable labeled sensation seeking has long been documented as a risk factor for alcohol and drug use. Previous studies conducted by Zuckerman (1979, 1983, 1987a,b, 1994) indicated that individuals with higher sensation seeking needs tend to become users earlier in life. In addition, these individuals are more prone to becoming regular users. Zuckerman's early research also indicated that sensation seeking increases during adolescence, tapering off in the mid to late twenties. After examination of sensation seeking and adolescent alcohol and drug use, Segal, Huba, & Singer (1980) determined that two factors that may account for this association. These factors provide a source of stimulation for the drug and alcohol use. Webb, Baer, Francis, and Card (1993) also attempted to examine the relationship and concluded that sensation seeking has both direct and indirect effects on alcohol use. Defronzo and Pawlak (1993) reported an association between alcohol and attention seeking behaviors. The manifestation of bold, overt behaviors during and proceeding alcohol consumption supported the common notion extraverting effect of alcohol (Defronzo & Pawlak, 1993).

Baer (2002) reviewed college-drinking studies conducted in the last thirty years within United States colleges and universities, in order to assess individual differences in drinking and associated problems. Aspects examined included family history and parental behavior, personality, drinking motives, and alcohol expectancies. Baer acknowledged that the pervasive use of convenience sampling in the studies reviewed restrict the generalizability of the findings. Several studies reviewed by Baer examined personality factors assumed to influence substance use including impulsivity/disinhibition, extraversion/sociability, and neuroticism/emotionality (Baer, 2002). These constructs have been used as predictors of alcohol use in college students.

Several researchers have identified a pattern linking impulsivity/sensation seeking and alcohol consumption (Brennan et al., 1986, Camatta & Nagoshi, 1995, MacDonald et al., 1991, Havey & Dodd, 1993). Sensation seeking is associated with higher levels of alcohol consumption as well as an increased frequency of drinking. Heavier drinkers are classified as pleasure seeking, impulsive, extraverted, rebellious, and nonconforming. Studies also verify that students with a history of deviant behavior are more likely to begin alcohol consumption earlier in life and continue to show greater alcohol consumption during college years (Gonzalez', 1989). In addition, nonconformity and deviance were associated with multiple substance use. Students who used marijuana and cigarettes reported heavier drinking (Wechsler et al., 1995). Students who are more rebellious and less committed to traditional values have a higher tendency to consume alcohol. Those who responded, "Religion was not important," noted heavier drinking and related problems. By contrast, respondents who stated, "Religion is important" had reduced frequency of drinking (Baer, 2002).

The relationship between extraversion/sociability and alcohol consumption tends to complex. Extraverted students, as well as nonextraverted students who place a great emphasize on parties, tend to drink more than other college students do (Wechsler et al., 1995). Occasional heavy drinking was associated with a greater number of relationships among students. A study

by Nezlek, Pilkington, and Bilbro (1994) put forth the idea that students who experience occasional heavy drinking episodes appear to be more adapted and integrated into the college atmosphere. Consequently, drinking rates appear to be associated with extraversion/sociability but are not necessarily related to alcohol problems.

Research on neuroticism/emotionality has explored the link between college students' alcohol use and problems associated with anxiety, depression, loneliness, and frustration. Research has suggested that anxiety leads to increased alcohol use (Baer, 2002). In addition, a strong relationship between drinking and self-esteem was noted in females (Baer, 2002). Heavier drinking was associated with lower self-esteem, which suggested that alcohol consumption would increase over time if self-esteem stays low. In addition, among female college students, loneliness, boredom, frustration, and depression were related to both drinking frequency and quantity.

Baer's review of this issue also briefly examined drinking motives. The two main motives that seem to underlie college alcohol use involve social purposes and desire for emotional escape. Over time, escape motives are related to increased drinking and problems. Cronin (1997) stated three reasons for drinking, which include social camaraderie, mood enhancement, and tension reduction. In conclusion, students who consume more alcohol tend to score higher on measures of sensation seeking, and this may also relate to their choice of drinking partners. Further research on developmental processes should explore these relationships over time in order to provide clearer information on risk factors and allow modification of prevention programs (Baer, 2002).

Sher & Bartholow (2000) examined personality factors and substance use by using two comprehensive measures of personality. Cloninger's model uses the Tridimensional Personality Questionnaire (TPQ) and Eysenck employs the Eysenck Personality Questionnaire (EPQ). In addition to completing the TPQ and EPQ, the participants were assessed via an interview at baseline, yearly intervals for three years, and again three years later. The questionnaires measure basic personality characteristics that are hypothesized to be related to alcohol abuse.

Cloninger's model focuses on three traits that relate to dimensions of personality. He believed that these three factors along with environmental factors contribute to brain-behavior relationships that predispose individuals to alcohol dependency. Those high in novelty seeking (NS) are described as being impulsive, excitable, quick-tempered, and disinhibited. Studies conducted by Cloninger have concluded that high novelty seeking predicts substance use and related problems. In addition, novelty seeking is correlated with sensation seeking (Zuckerman, 1994). Harm avoidance (HA) is described as being cautious, apprehensive, inhibited, and sensitive to punishment. Sher, Wood, Crews, & Vandiver (1995) suggested that harm avoidance may play an important role in predicting alcohol dependence. The final factor on Cloninger's model is reward dependence (RD). This personality factor relates to being warm, ambitious, sympathetic, and persistent.

Introversion-extraversion (E), neuroticism (N), and psychoticism (P) are personality dimensions that comprise the Eysenck model. Extraversion describes those who are sociable, lively, sensation seeking, and carefree. The neuroticism trait describes individuals who are anxious, depressed, and characterized by a negative emotional state. Psychoticism, the final trait in the Eysenck model describes individuals who are aggressive, cold, tough-minded, and impulsive has previously been used to associate alcohol abuse with psychoticism and neuroticism.

The results of the Sher and Bartholow study indicated that novelty seeking and psychoticism were slightly associated with alcohol abuse. In addition, neuroticism and harm avoidance were strongly associated with alcohol use. Both cross-sectionally and prospectively, the traits that related to disinhibition were the most consistent predictors of substance use disorders. These traits include novelty seeking and psychoticism. Extraversion was also identified as a cross-sectional predictor of alcohol use.

Kopstein, Crum, Celentano, & Martin (2001) investigated the association between sensation seeking and adolescent cigarette and marijuana use. Disinhibition and thrill and adventure seeking factors were explored in 8th and 11th graders in Delaware school districts. Others scales of sensation seeking included experience seeking and boredom susceptibility (Kopstein et al., 2001). Zuckerman (1986) defines sensation seeking as the need for risky experiences and enjoyment of frightening activities. Disinhibition is defined as the desire to seek social stimulation that permitted social drinking. It includes rebelling against social norms. Zuckerman (1986) also notes that as social acceptance of substance use increases, the relationship between sensation seeking and substance use decreases. Therefore, a substance that is considered risky and less widely sanctioned would present a stronger relationship between sensation seeking and substance use.

Previous research by Zuckerman, Ball, and Black (1990) has indicated that both thrill and adventure seeking and disinhibition are associated with substance use. In addition, sensation seeking has been linked to earlier onset of substance use, according to research conducted by Pederson (1991). Young adults who begin substance use earlier are more likely to engage in higher rates of substance use. Segal, Huba, & Singer (1980) proposed two modes of stimulation for the substance abuse. Some individuals may receive a direct neurological stimulation, which provides the motivation for use. By contrast, other users may be motivated by the illegality of the drug, and the opportunity to reject authority.

Researchers hypothesized that sensation seeking needs would be the most important predictor of substance use in 8th graders, since it is more normative to smoke for older adolescents. The four outcomes measured were current cigarette smoking, heavy cigarette smoking, current marijuana use, and heavy marijuana use. The results of a univariate regression indicated that disinhibition was significantly associated with all four outcomes of substance use. Therefore, disinhibition was shown to be a strong risk factor of both marijuana and cigarette use. High disinhibition 8th graders were found to be six times more likely to smoke cigarettes and five times more likely to smoke marijuana (Kopstein et al., 2001). In addition, thrill and adventure seeking was not a significant predictor of cigarette use or marijuana use. Results also indicated that the strongest predictor of marijuana smoking was peer use. Peer use served as the most important explanatory variable for current marijuana and cigarette smoking. Another important predictor of marijuana use for both 8th and 11th graders was poor grades. Parental influence may help to motivate children to quit because it was found that parents might influence smoking habits (Kopstein et al., 2001). Rutledge & Sher (2001) investigated the multiple causes of drinking including stress, tension-reducing motives, gender, and personality factors. Research has indicated that substance use is influenced by multiple factors; therefore, this study is aimed at exploring the interaction of the above variables. The three personality factors of neuroticism/negative emotionality, impulsivity/disinhibition, and extraversion/sociability have been associated with alcohol use; therefore, these variables were particularly important in this study. The study was also conducted in order to obtain information regarding stress-related drinking. Rutledge & Sher (2001) also explored the relationship between stress and drinking,

more specifically the role of tension-reduction drinking motives. In addition, the probability that personality factors moderated significant relationships between, stress, tension-reduction drinking motives, gender, and heavy drinking (Rutledge & Sher, 2001).

The participants were examined at year 1, 2, 3, and 4. Three years following the study, the participants were again examined to determine developmental trends from late adolescence and early young adulthood. The data were collected using the Eysenck Personality Questionnaire in addition to collecting frequency of heavy drinking. In addition, the study controlled for history of alcoholism by dividing the sample into two groups, positive family history and negative family history.

The results of this study indicated that stress was not significant in any analysis at any year. Heavy drinking in all four years of the study were positively related to tension-reducing drinking motives. When gender was examined, men were likely to engage in more drinking than women at all years. In addition, heavy drinking in men was also positively associated with behavioral undercontrol. Highest levels of drinking were associated with high scores in both behavioral undercontrol and tension-reducing drinking motives. The study indicated that the present results were limiting, therefore, investigation of the personality factors should be further investigated. The only personality variable that should some effect was behavioral undercontrol. Therefore, this relationship may be more complex than the researchers thought.

Research conducted by Thombs, Beck, Mahoney, Bromley, & Bezon (1994) explored teenage alcohol use in regards to social context and sensation seeking. Thombs et al. administered a questionnaire to public school students in western New York State. The questionnaire was given during an extended homeroom period in four rural schools in an attempt to measure alcohol use, the social context of drinking, and a personality trait, sensation seeking. The average age of the subjects was fifteen. Sensation seeking was used to discriminate students who are high-risk drinkers. Knowledge of social context and sensation seeking trait scores were hypothesized potentially to allow for distinct ways of preventing further abuse.

Participants were divided into three categories, including low, moderate, and high intensity drinkers. The subjects were also classified as either alcohol-impaired drivers or nonimpaired drivers. The results indicated that high-intensity drinkers tend to consume alcohol in a context of social facilitation, in contrast with low-intensity drinkers, who do not. In addition, sensation seeking was found to be an important factor in determining the different types of drinkers. The findings suggest that drinking specific measures are better predictors of different drinking patterns in adolescence than global personality measures. However, sensation seeking is important when differentiating low, moderate, and high-intensity drinkers.

Thombs et al. (1994) also suggested that adolescence is a time of increased sensation seeking. Therefore, resistance programs should be aimed at this at-risk population. Programs such as post-prom parties held at the school would simulate a party-like atmosphere without alcohol. They could offer other exciting activities to grab the attention of young people and provide alternative means of satisfying high stimulation seekers (Thombs et al., 1994).

Donohew, Hoyle, Clayton, Skinner, Colon, & Rice (1999) investigated the influence of individual sensation seeking and peer sensation seeking on the use of alcohol and marijuana. Donohew, et al. (1999) examined information obtained via self repot measures, including sensation seeking, family relations, alcohol attitude, peer pressure, and individual use of alcohol and marijuana. In a previous study conducted by Donohew, Helm, Lawrence, & Shatzer (1990) it was found that eighty percent of adolescents who used specific drugs were high sensation seekers. Therefore, this study was constructed in order to investigate peer sensation seeking and

individual sensation seeking in order to determine individuals at higher risk of substance use. The researchers hypothesized that individuals with higher sensation seeking attributes tend to have similar interests. In addition, they tend to be associated with the same peer group. The researchers also believed that higher sensation seeking tendencies influence future association with drug using peer groups. Therefore, according to Donohew, et al. (1999), those who use drugs will tend to associate themselves with other drug using peer groups.

Donohew, et al. (1999) measured sensation seeking using the Sensation Seeking Scale. Participants filled out a questionnaire about themselves and their named peer in order to determine their individual level of sensation seeking and their peers' level of sensation seeking. This study determined that both sensation seeking and peer influence are factors in drug and alcohol use. The study verified that notion that individuals pick friends with similar sensation seeking tendencies. Interestingly, as they search for higher sensation seekers, they are already engaging in a sensation seeking activities. Therefore, prevention programs will improve if both individual and peer variables are taken into account (1999).

Previous research has suggested that high impulsivity is associated with alcohol use. Higher impulsivity was also noted among men than women. Therefore, Waldeck and Miller (1997) explored gender and impulsivity differences in substance use (alcohol, nicotine, and caffeine). Gender differences and personality factors such as impulsivity, antisocial features, and nonconformity were measured. Previous research has also indicated that impulsivity and sensation seeking are strongly linked to college drinking problems. These behaviors are typically associated with masculine roles; however, Beckwith (1986) noted that there was a significant correlation between alcohol use and impulsivity in females as well. In addition, high impulsivity is also associated with increased use of nicotine and caffeine. Waldeck and Miller (1997) hypothesized that male and female participants showing higher impulsivity would report greater use of all three substances.

Subjects were introductory to psychology students who completed a questionnaire that contained the Chapman scales of Psychosis-proneness (Chapman & Chapman, 1985) and a questionnaire regarding licit substance use. The Chapman scales measured impulsivity and nonconformity. Alcohol use was measured through self-reported data on number of drinks per week. Nicotine use was assessed in terms of the number of cigarettes and tins of smokeless tobacco used per week. Lastly, caffeine intake was measured by assessing daily consumption of coffee, tea, cola, and over the counter stimulants (Waldeck & Miller 1997).

The results indicated that high impulsivity was associated with high alcohol use in both men and women. However, men and women differed in their nicotine and caffeine use. Women with high impulsivity were found to engage in high nicotine use. However, women's caffeine use was not influenced significantly by their impulsivity. In contrast, men with high impulsivity were found to report higher caffeine use. Impulsivity in men was found to predict nicotine use. In addition, men reported higher use of alcohol and nicotine than women regardless of impulsivity. This finding contradicts another study, which found that women report higher caffeine use than men (Landrum, 1992). Therefore, more research should be conducted in this area. In addition, this study should be conducted using an older adult population in order to assess the generalizability of the results (1997).

A study conducted by Comeau, Stewart, & Loba (2001) examined the relationships among trait anxiety, anxiety sensitivity, and sensation seeking and adolescents' motivation for substance use, including alcohol, cigarettes, and marijuana. Comeau et al. used the trait subscale of the State-Trait Anxiety Inventory for Children (Spielberger, Edwards, Montouri, & Lushene,

1973), Childhood Anxiety Sensitivity Index (CASI) (Silverman, Fleisig, Rabian, & Peterson, 1991) and the Intensity and Novelty subscales of the Armett Inventory of Sensation Seeking (Arnett, 1994). In addition, the subjects (junior and seniors in high school) also completed the Drinking Motives Questionnaire-Revised (DMQ-R). The study was aimed at investigating the association between personality factors (including anxiety sensitivity, trait anxiety, and sensation seeking) and four categories of substance use motivations. Cooper (1994) proposed that drinking provided both external internal rewards and that adolescence may drink to obtain positive reinforcement or to avoid a negative outcomes. Therefore, Cooper proposed a theory, which integrated these variables to generate four specific drinking motives: coping, conformity, enhancement, and social.

Each of the personality factors was expected to relate differently to substance use. Trait anxiety is defined as the tendency to experience anxiety-like symptoms in many different situations. A previous study conducted by Stewart and Zeithlin (1995) found that high trait anxiety was a significant predictor of coping motives for both alcohol and cigarette smoking. Therefore, individuals who exhibit high trait anxiety might be expected to use alcohol as a coping mechanism. Anxiety sensitivity involves the fear of anxiety in certain situations that will lead to negative outcomes, such as social embarrassment or physical illness. This trait predicts increased drinking and increased problems related to drinking. In addition, studies show that anxiety sensitivity has been related to coping motives in both alcohol and cigarette use. Lastly, sensation seeking refers to a need for intense, risky situations. There are two types of sensation seeking that were examined, novelty seeking and intensity seeking. Cooper, Frone, Russell, & Mudar (1995) found that this personality trait was associated with enhancement motives for alcohol use. Cooper et al (1995) hypothesis was that the personality measures would predict three substance use motives, (conformity, coping, and enhancement). They expected that anxiety sensitivity would predict conformity motives for alcohol use and that that anxiety sensitivity and/or trait anxiety would also predict conformity motives for cigarette and marijuana use. Comeau, et al. (2001) also explored sensation seeking as it related to enhancement motives and whether the motives were due to intensity seeking or novelty seeking.

The results of the Comeau, et al. (2001) study indicated that all of personality factors examined were associated with the risky behavior of substance use. In addition, the personality factors were associated as expected with the three motives examined, coping, enhancement, and conformity. Sensation seeking was found to be associated with enhancement motives for alcohol use, consistent with previous adult studies. Anxiety sensitivity was associated with conformity motives for alcohol and marijuana use. Therefore, teens with high anxiety sensitivity seem to be using these substances to reduce the anxiety that could occur in social contexts. Anxiety sensitive users may feel the social pressure at parties and feel the need to conform to lower their level of anxiety. Overall, personality factors are more likely to be associated with alcohol use rather than cigarette and marijuana use (2001).

Wagner (2001) explored the relationship of various personality factors and demographic characteristics to substance abuse, risky sexual behavior, reckless driving, and theft. He hypothesized that high sensation seekers are likely to report engaging in more substance use and other risk taking activities than low sensation seekers. In addition, it was hypothesized that participants high in anxiety sensitivity are more likely to report more substance use that those who report lower anxiety sensitivity. It was also expected that there would likely be a negative correlation between sensation seeking and anxiety sensitivity.

Undergraduate students were examined using the Sensation-Seeking Scale, the Areiss-Epstein-Gursky Anxiety Sensitivity Index, the Heiby Self-Reinforcement Questionnaire, the Reckless Behavioral Questionnaire, and the Substance Abuse Attitude Survey. Both sensation seeking and anxiety sensitivity were found to be significant predictors of substance use. As expected, high sensation seekers were more likely to engage in alcohol and/or drug use. In addition, there was a negative correlation between anxiety sensitivity and substance use ($r = -.21, p = .01$), which suggested that individuals with high anxiety sensitivity were less likely to abuse alcohol and/or drugs (Wagner, 2001).

Thus, this study only supported one of the researcher's hypotheses, that high sensation seekers are more likely to use substances such as alcohol and drugs. This study did not find the expected negative correlation between sensation seeking and anxiety sensitivity, suggesting that sensation seeking and anxiety sensitivity act independently of each other. A negative correlation was expected because sensation seekers seek stimulation, while anxiety sensitive individuals fear or avoid physiological arousal.

Research by Wood, Cochran, Pfefferbaum, and Arneklev (1995) explored high school students' substance use, including, drinking alcohol, getting drunk, tobacco use, marijuana use, and use of harder drugs, in order to determine whether personality factors such as sensation seeking could explain the prevalence and frequency of use. They hypothesized that such behaviors are due to internal motivation as well as to societal pressures. Internal motivation is specifically noted as involving the intrinsic rewards associated with psychoactive substance use.

Delinquent behavior, such as stealing, could produce material gains, however substance use provides excitement and a thrill, which could reward some individuals. In addition, some substances provide a "high" or "feel-good effect", which reinforces the behavior and provides instant gratification. Wood, et al. relate this phenomenon to learning theory. Sensation seeking personality traits, such as thrill seeking, immediate gratification, and impulsivity, lead to substance use/delinquent behaviors which consequently provide stimulation of the endogenous reward system (1995).

Questionnaires given to high school students in Oklahoma to examine race differences in the prevalence of substance use and delinquency provided the data for this study. The study used a combination of items from the CPI (California Personality Inventory) impulsivity scale due to its success in predicting thrill seeking behavior. Because a need for thrill seeking behavior is also characteristic of sensation seeking, the researchers constructed a sensation seeking scale, which consisted of six items measured on a four-point Likert scale. For example, one of the six items stated, "I get a real kick out of doing things that are a little dangerous". The final scale examined the need for instant gratification. The CPI scale had an internal reliability of .80; the thrill seeking scale had an alpha reliability of .83, and the instant gratification scale had an alpha reliability of .73. However, these scales are noted as being relatively untested. Researchers controlled for age, gender, race, socioeconomic status, and rural/urban residence status. In addition, researchers measured the prevalence and frequency of substance use during the past four-week period. Measurements included number of days the participants had used tobacco products, consumed alcoholic beverages, gotten drunk, smoked marijuana/hash, and used hard drugs such as cocaine, crack, speed, heroin, and LSD (1995).

Results indicated that underage use of alcohol and tobacco was more prevalent than other types of substance use in the high school subjects. Only 13% of the high school subjects reported marijuana use in the past 28 days. After determining the prevalence and frequency,

analyses of the primary reasons for the substance use were examined. Both tobacco and marijuana users frequently reported that "it made me feel good". This was the primary reason for both tobacco and marijuana use (Wood et al., 1995). The substances apparently provide a physiological effect that offers immediate gratification, thereby reinforcing the action. Not surprisingly, the second primary reason for substance use is the thrill and excitement associated with the use. Another reason for underage alcohol use could be peer pressure. However, this study showed that subjects only used alcohol 10% of the time "when friends were doing it". The research suggests that the thrill, fun, and excitement of underage drinking and getting away with it are important factors not influenced by peer pressure. This study also suggested that thrill seeking and impulsivity promote the likelihood substance use. In addition, instant gratification reinforces the behavior, which is likely to be linked to a physiological reward system. Therefore, this study can be viewed as supporting the learning theory account of adolescent substance use. Individuals are attracted to certain thrill-seeking behaviors and the experience of substance use is rewarded subjectively.

The current study investigated the relationship between five basic personality dimensions and three types of substance use by surveying students. Both high school and college undergraduate students were assessed in order to permit the evaluation of developmental period differences in the relationship between personality and substance use. Information gleaned from this investigation may assist in the development of more effective educational programs aimed at curbing substance use. Understanding the association between basic personality characteristics and risk of substance use may help educators to identify students most at risk of developing dependence on alcohol, cigarettes, and/or marijuana.

Method

Participants

Respondents were 155 college students from a small liberal arts college from a suburban area in the Northeast United States and 108 high school students attending a public school in the same area. One hundred and thirty-five female students and 128 male students, with a combined mean age of 18.04 years, responded. The survey was administered to college students enrolled in introductory and upper level psychology courses, and high school students enrolled in health education classes.

Survey Instrument

A survey was used, consisting of two parts; the first part of the questionnaire was the Mini Markers Five Factors Personality Scale (Saucier, 1992) designed to give a quick assessment of the subject's personality according to the Big Five Trait model. This scale listed 40 alphabetized personality traits, 8 applying to each overall characteristic. The subject rated the degree to which he or she possesses each trait on a Likert-format scale. The second part of the questionnaire, an author-devised survey, consisted of 200 questions assessing the subject's reported substance abuse behavior and subsequent perceptions of students engaging in these behaviors. In addition, demographical information such as age, sex, and substance abuse behavior of the parents was requested.

Results

Directionally adjusted items were totaled to create summary scores for extraversion, neuroticism, agreeableness, conscientiousness, and intellectance. A median split was performed on the summary scores of the five personality factors to create high and low level groups for each of the five traits.

Correlational analyses of the data from the entire sample revealed a relationship between extraversion and alcohol use ($r = .14$, $p < .05$), intellectance and alcohol use ($r = -.18$, $p < .01$), and conscientiousness and cigarette use ($r = -.12$, $p < .05$). Use of alcohol, cigarettes, and marijuana were all significantly intercorrelated (r range: .36 to .59; $p < .001$). No significant relationships between personality and marijuana use were noted.

In order to assess differences across developmental period, responses from the high school students and college students were analyzed separately. Although marijuana use was not differentially associated with personality factors for the sample considered in its entirety, significant correlates emerged when the high school and college samples were investigated separately. For the high school sample, agreeableness was significantly negatively correlated with alcohol, marijuana, and cigarette use (alcohol, $r = -.28$, $p < .01$; marijuana, $r = -.21$, $p < .05$; cigarettes, $r = -.32$, $p < .001$). Conscientiousness and alcohol use were also significantly correlated ($r = -.20$, $p < .05$). For the college sample, there was a significant relationship between intellectance and marijuana use ($r = .24$, $p < .01$). A strong association between alcohol and marijuana use ($r = .38$, $p < .001$) and an association between alcohol and extraversion ($r = .22$, $p < .05$) were found. There was no significant relationship between cigarette use and any of the personality factors within the college sample.

Extraversion was correlated with neuroticism ($r = -.17$, $p < .01$) and agreeableness ($r = .19$, $p < .01$). Neuroticism was negatively associated with agreeableness ($r = -.24$, $p < .001$). There was a strong positive relationship between conscientiousness and extraversion ($r = .22$, $p < .001$) as well as conscientiousness and agreeableness ($r = .36$, $p < .001$). Additionally, a significant negative association between conscientiousness and neuroticism emerged ($r = -.19$, $p < .01$). Intellectance was positively associated with both extraversion ($r = .24$, $p < .001$) and agreeableness ($r = .23$, $p < .001$).

Discussion

Consistent with previous research (Eysenck, 1967), this study found a modest but statistically significant link between extraversion and reported use of alcohol for the sample as a whole. This was expected because of the extraverted subjects' typical preference for social situations, which are standard settings for alcohol use during the high school and college years.

Intellectance was found to be inversely related to alcohol use. This may be due to the fact that low intellectance participants are likely to be less engaged and successful in school, which may reduce their identification with positions on drug use adopted by teachers and other authority figures. Their lower level of intellectual focus and poorer academic performance may also increase their likelihood of being grouped academically with peers who reinforce antiestablishment norms and endorse substance abuse.

Students' level of conscientiousness was inversely related to cigarette use, but not to the other two types of substance use investigated (alcohol and marijuana). This may be attributable to the impact of several recent public health campaigns targeting adolescents, which highlight the risks associated with cigarette smoking. This message may be effectively influencing highly

conscientious students, while being largely ignored by their less conscientious peers. The selective focus on cigarette risks may account for why use of alcohol and marijuana were not linked to this personality characteristic.

It is also possible that more conscientious high school and college students place themselves under more pressure to perform, which may increase their level of stress. Since many students use both alcohol and marijuana to reduce the experience of stress, it may be that the conscientious students' greater motivation to counter performance-pressure related stress counterbalances their greater likelihood to conform to standards. The net result would be the observed equivalent use of alcohol and marijuana among high and low conscientious students. However, the fact that in this sample conscientiousness was negatively associated with neuroticism raises questions about whether highly conscientious students actually do experience elevated stress or anxiety levels.

Further research exploring the role of anxiety in mediating the observed relationships could shed additional light on how personality influences substance use choices. This clarification would enable development of more targeted educational prevention and treatment programs. For example, if highly conscientious students are allowing the desire to reduce stress to override their usual careful judgment in making the decision to use marijuana and alcohol, educational programs emphasizing alternative stress management techniques (relaxation training, yoga, exercise, etc.) might be most effective for these students. If less conscientious students "tune out" public health messages about the risks of smoking, special outreach efforts in high schools might be designed for these students. Involving them as active participants might be a more effective way of engaging their sense of self protectiveness when they confront the choice of whether or not to use tobacco.

The failure to find any link between personality traits and marijuana use in the overall sample suggests that consideration of personality characteristics may be a less helpful way of detecting students at risk of marijuana use. These findings are also consistent with the notion that because access to marijuana is somewhat more limited (because of its general illegality at all ages), situational factors such as peer group may be more determinative of its use than the student's personal factors. This argues for more strenuous efforts to influence peer subgroups within schools that serve to sanction, support, and supply marijuana use.

Although no personality correlates of marijuana use emerged for the combined age groups, among high school students marijuana use was inversely related to agreeableness. This might prove useful for those attempting to discern at risk high school students, although it is conceivable that the more negative agreeableness scores among high school marijuana users (and alcohol and cigarette users) might be an effect rather than a cause of use.

Among college students only, marijuana users were found to be higher on the intellectance factor. This suggests that the personal and peer factors related to marijuana use are different across developmental periods. This supports the need for tailoring of educational interventions on the basis of students' developmental stages.

The failure to find any relationship between scores on any of the five personality factors and cigarette use among college students suggests that with this population personality is of little utility in detecting at risk students. Apparently the decision to smoke tobacco is shaped less by global personality characteristics than by other determinative factors.

The significant interrelationship among all three types of substance use observed in this sample suggests that educational programs aimed at reducing one type of substance use might have benefits that generalize to other types of use. Programs emphasizing the merits of non-

substance means of coping with stress and boredom could be especially likely to foster a generalized reluctance to risk dependence on external substances. This finding also suggests that current educational efforts are failing to dissuade many adolescents from the general notion that substance use enhances the quality of life. It appears that once an adolescent begins experimenting with one mood altering substance, the chances of that student's trying additional types of substances increase quite dramatically.

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